



EOSDIS Archive Architecture

US Workshop on ISO Archiving Standards

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Additional Details on EOSDIS Architecture: <http://edhs1.gsfc.nasa.gov/>



EOSDIS

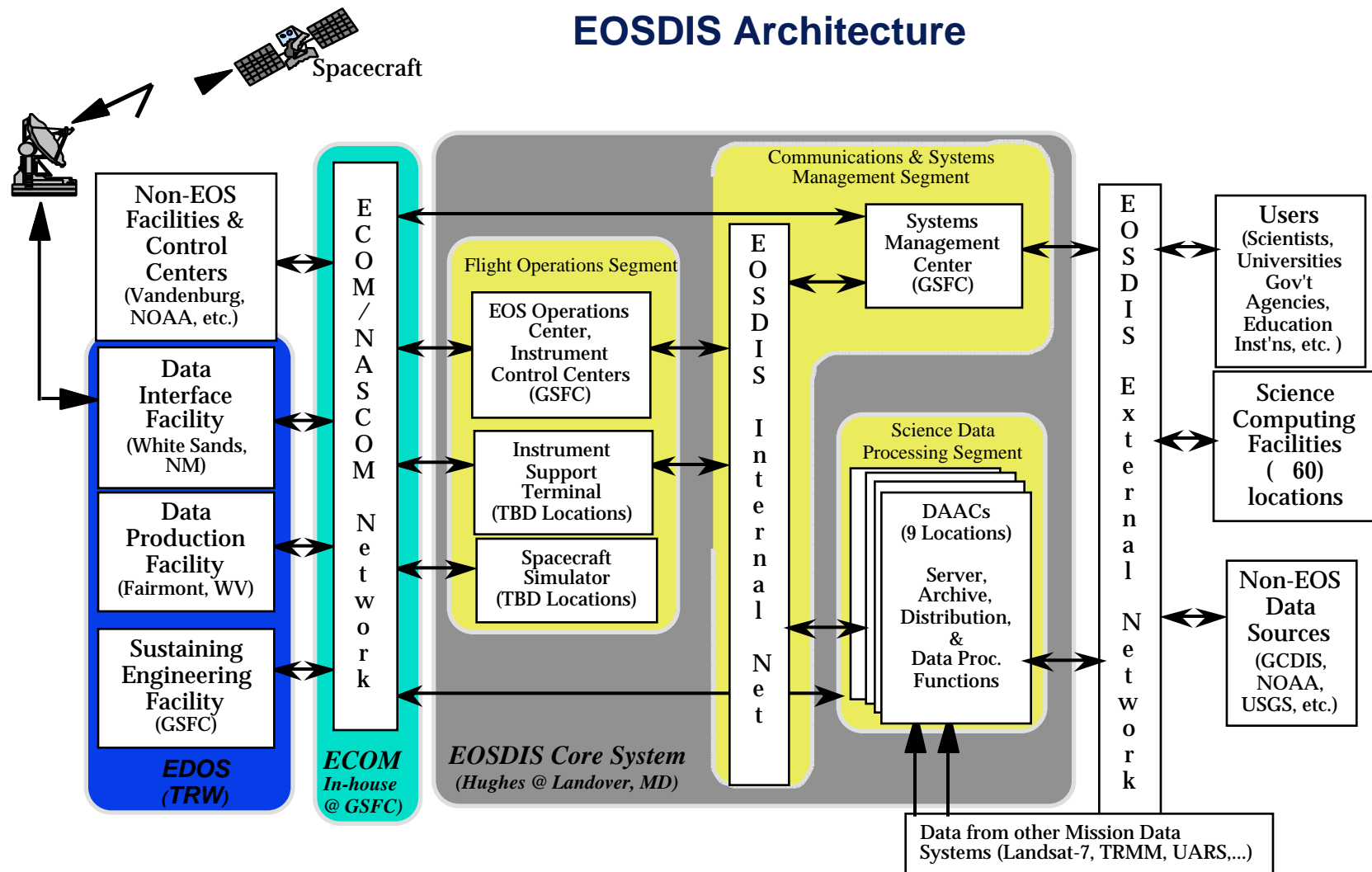
- **NASA's Mission to Planet Earth (MTPE)**
 - NASA's program to support the collection and distribution of reliable Earth and environmental science data to study global change
- **Earth Observing System (EOS)**
 - Beginning in 1997, a series of Earth science remote sensing satellites, known as the Earth Observing System (EOS), will be launched as NASA's centerpiece in support of the MTPE
- **EOSDIS (EOS Data and Information System)**
 - EOSDIS will be one of the largest data systems in the world (holdings in excess of 10's of petabytes) and will pose technological challenges in the areas of data processing, access, and distribution
 - Global change studies require that EOSDIS acquire and assemble a global database emphasizing remote sensing measurements from space over more than a decade
 - Plan, schedule, control, and command the space elements of the EOS mission.
 - Receive, process, archive, and manage all data from EOS instruments.
 - Provide support for data analysis, validation, and reprocessing to produce a long-term calibrated and consistently processed data.
 - The system architecture must accommodate the diversity in data types and data access requirements, changes in operational scenarios for product generation, and different centers of expertise during the EOS mission.
 - EOSDIS must promote exchange of data and research results within the science and education user community, across multiple agencies and internationally
 - Facilitate access to the data holdings, giving users tools and assistance to search, locate, select, and acquire the data best suited to their science investigations
 - Permit scientists to focus attention and resources on the research as opposed to the complex operational aspects of product generation.
 - Expedite development, experimental usage, and community acceptance of new and/or improved algorithms for computing geophysical parameters
 - Support the establishment of a sound scientific basis for policy decisions.



Major EOSDIS Components

- **Distributed Active Archive Centers (DAACs)** - Nine data centers, each focused on a science discipline area, including: Jet Propulsion Laboratory, Langley Research Center, EROS Data Center, Goddard Space Flight Center, Consortium for International Earth Science Information Network (CIESIN), Oak Ridge National Research Laboratory, Alaska SAR Facility, Marshall Space Flight Center, National Snow and Ice Data Center
- **EOSDIS Core System (ECS)** -
 - **Science Data Processing Segment (SDPS)** - Data acquisition planning, data product search and ordering, processing, archiving, and distribution
 - **Communications and System Management Segment (CSMS)** - Communications; networking; network management; and system-wide, site, and element resource and operations management
 - **Flight Operation Segment (FOS)** - EOS mission operations, including the planning, scheduling, commanding, and monitoring of U.S. spacecraft
- **Science Computing Facilities (SCFs)** - Science algorithm development, investigation, analysis, and processing
- **EOS Data & Operations System (EDOS)** - Acquire, process, & route telemetry data
- **EOS Communications System (Ecom)** - Data distribution

EOSDIS Architecture

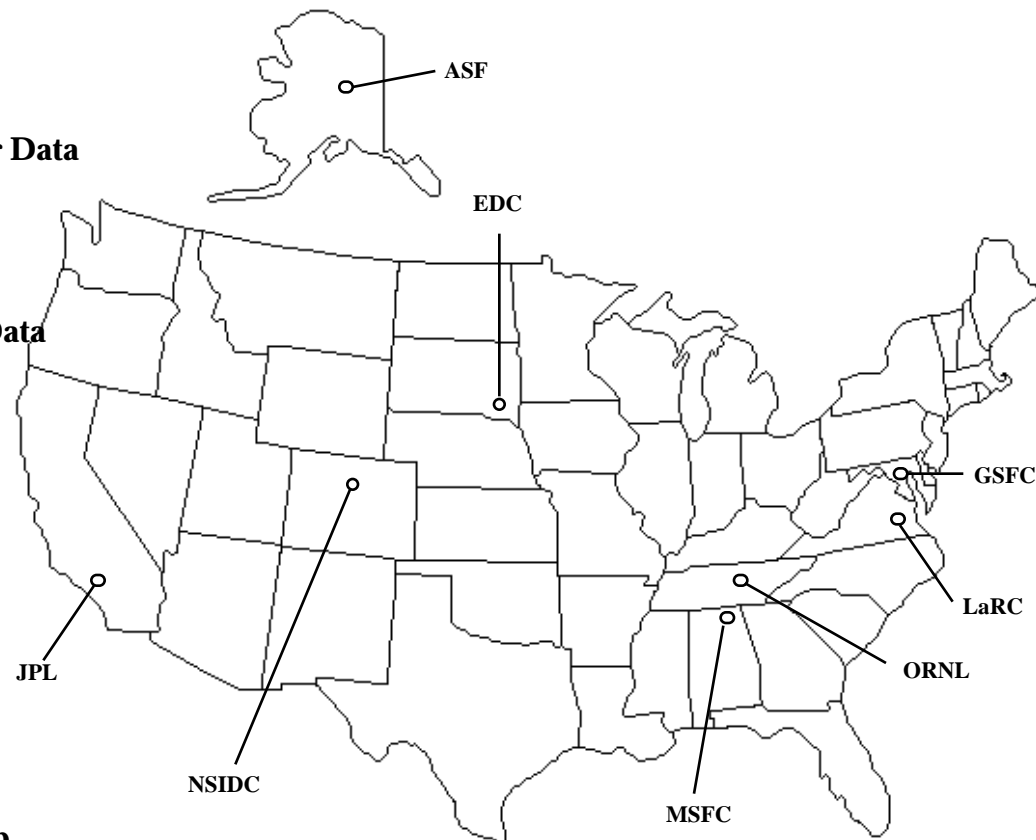




Distributed Active Archives

EOSDIS Data Centers

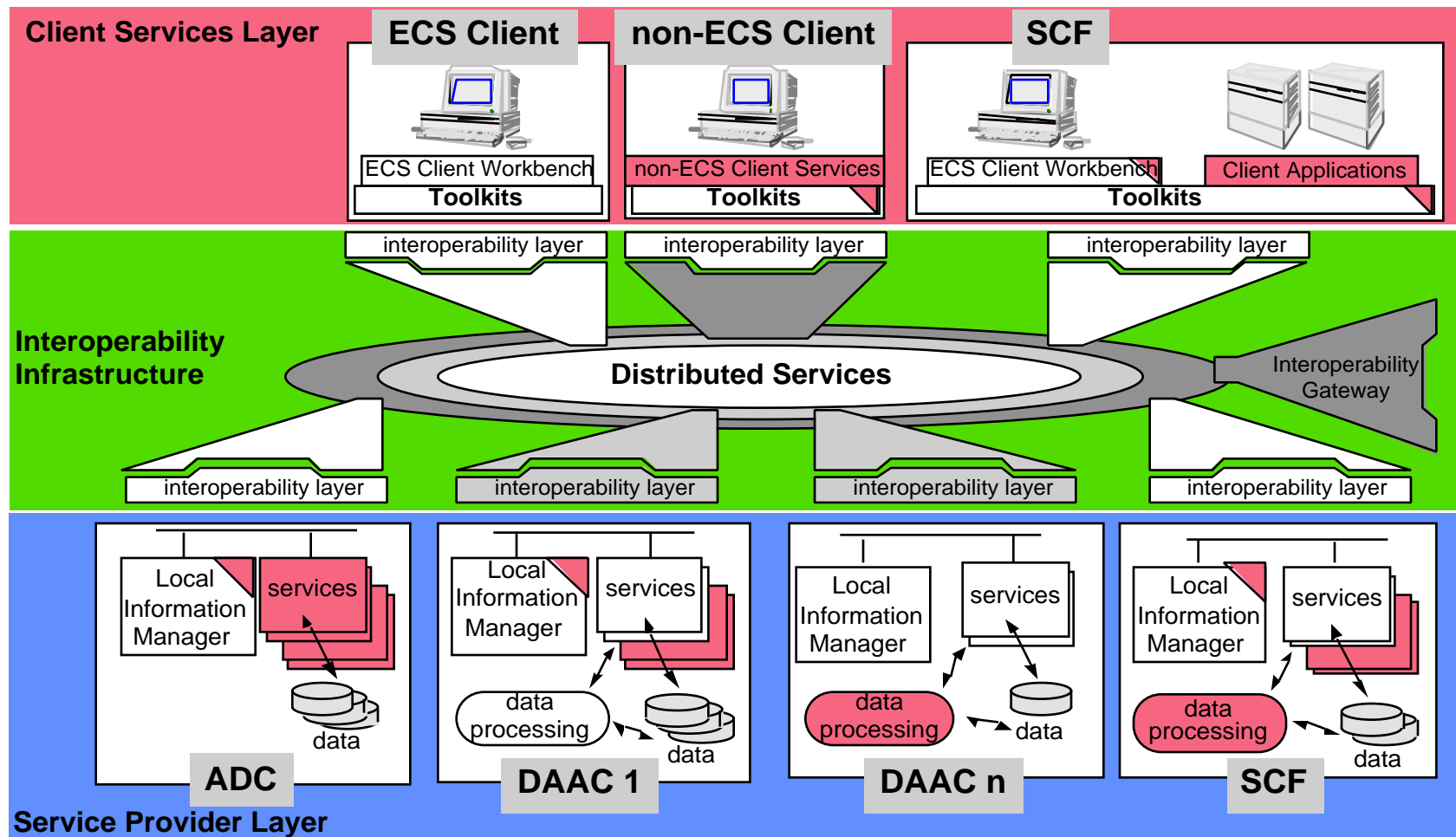
- **Distributed**
 - DAACs are Earth Science Discipline Oriented
 - Supported by Existing NASA and other Data Centers
 - Common Infrastructure
- **Active**
 - Online, Realtime and Batch Access to Data Provided
 - Range of Services
 - Browse/Advertise/Search
 - Subset
 - Parameter
 - Spatial
 - Temporal
 - Resample/Project
 - ...Others
- **Archive**
 - EDOS Provides Level 0 Data for Backup
- **Long-Term Archive Responsibility**
Transfer to NOAA, DOE, USGS



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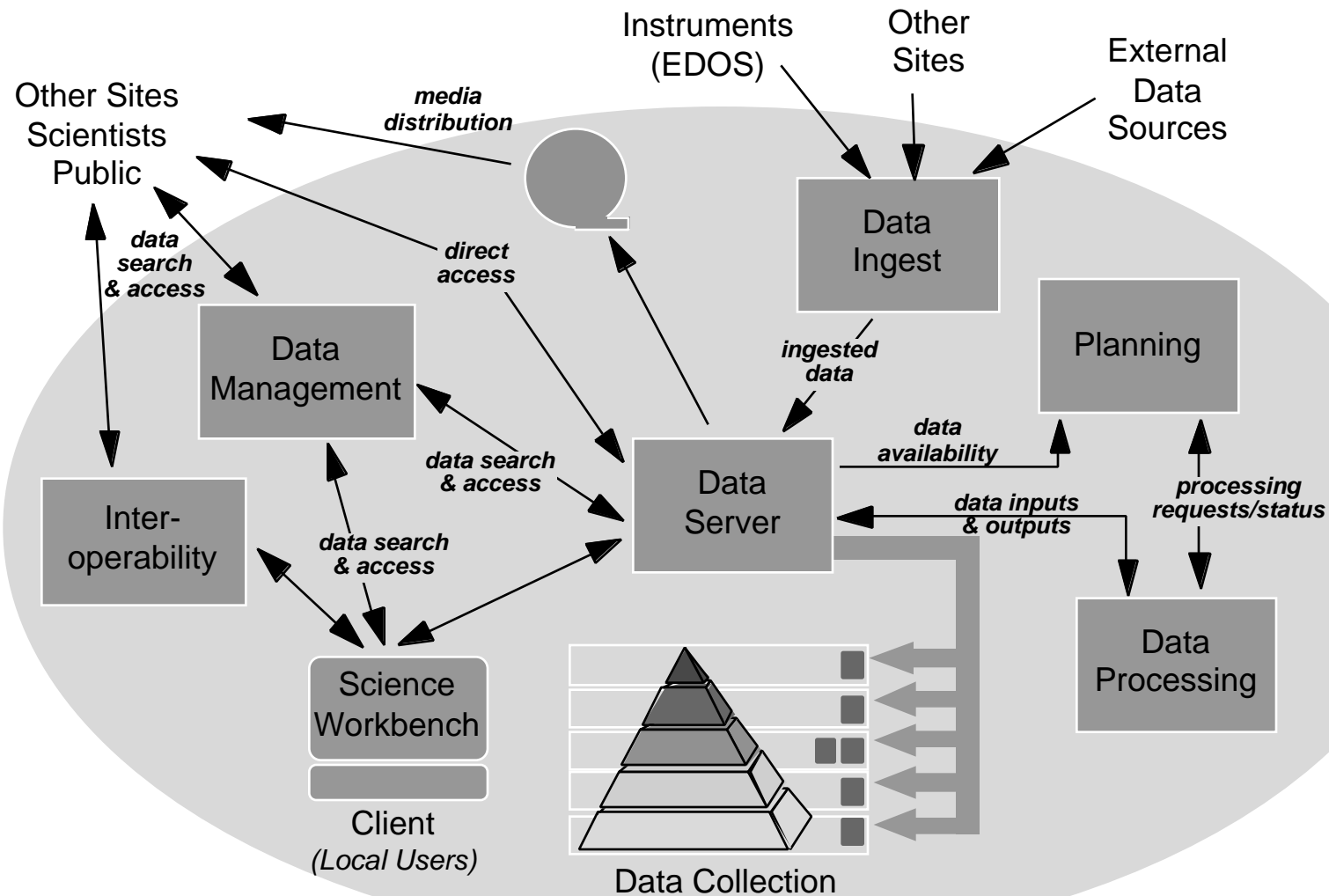


Science Data Processing Segment Architecture



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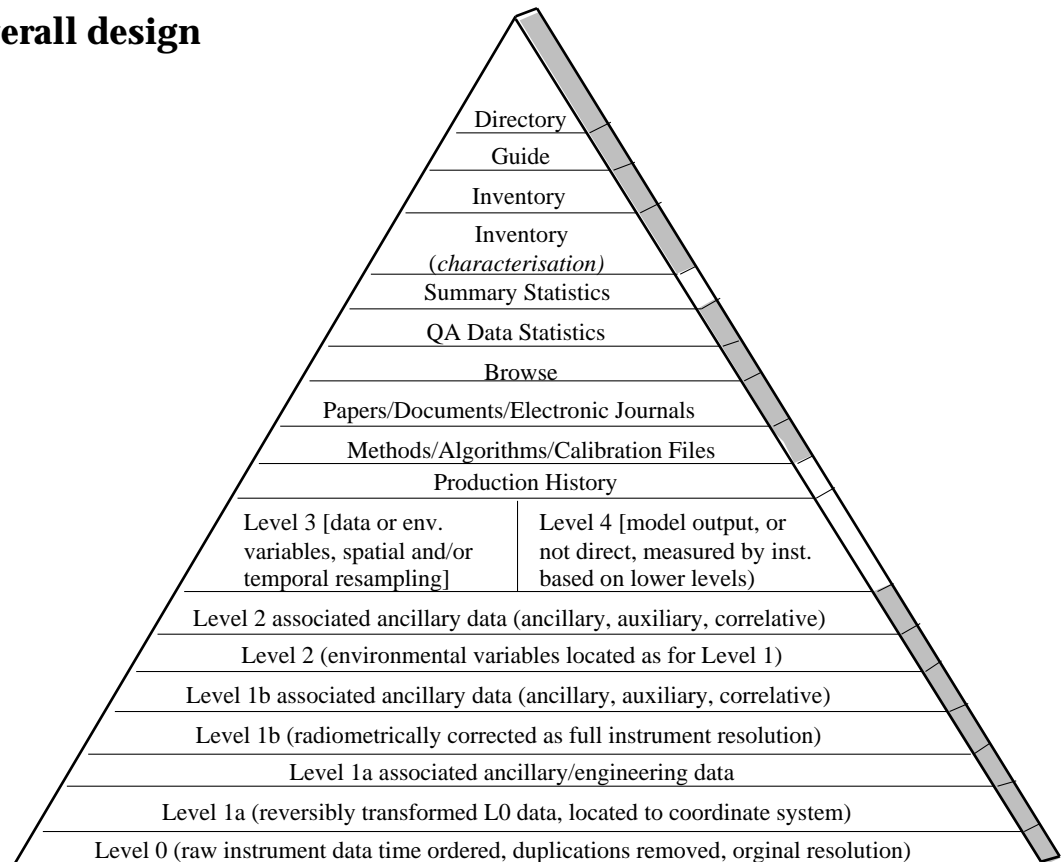


EOSDIS Data Model

- Data Model is a critical part of the overall design

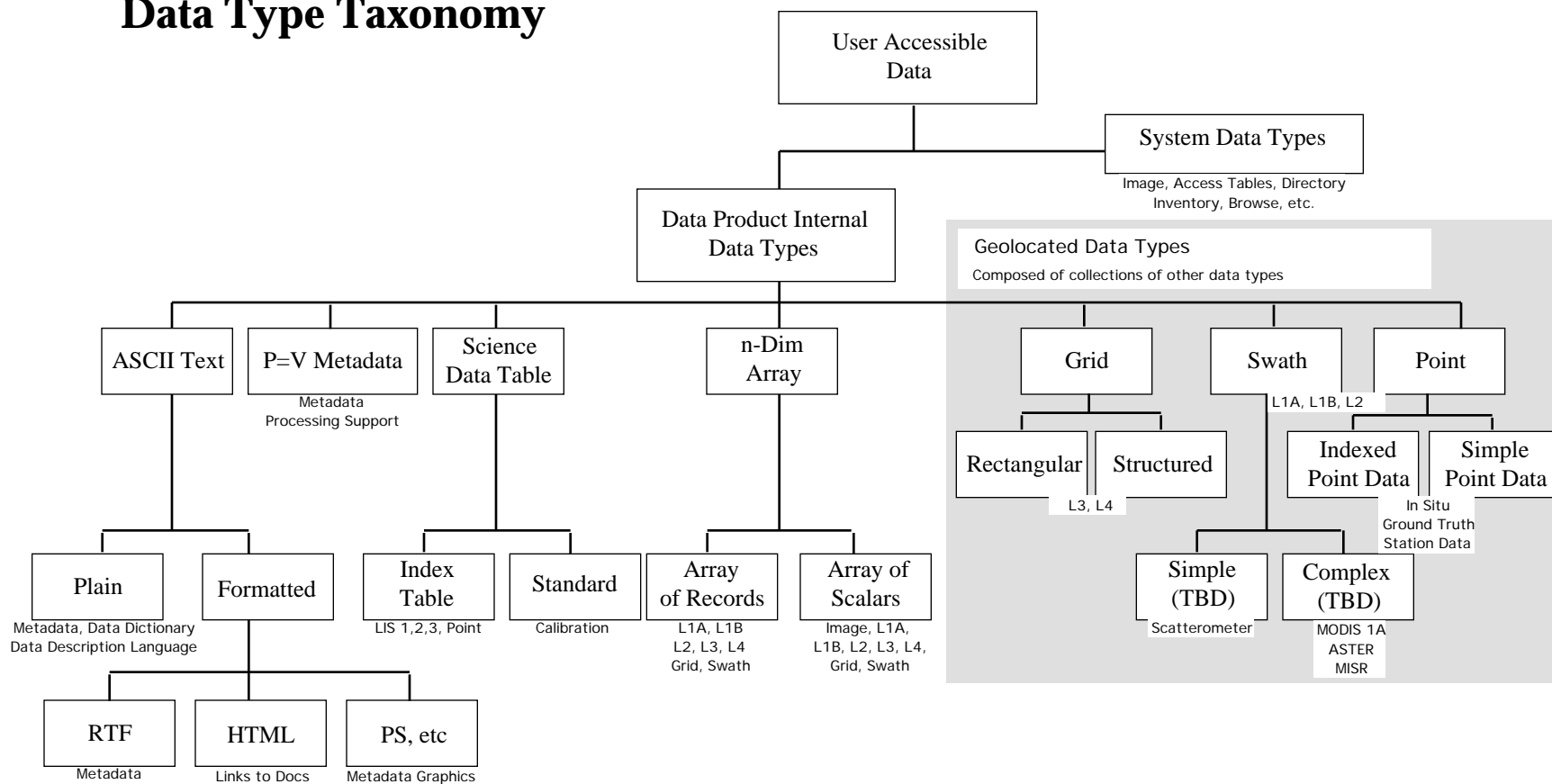
- Key features

- ☐ Data Collections
- ☐ Data Pyramid
- ☐ Earth Science Data Types [ESDT]
- ☐ Computer Science Data Types [CSDT]



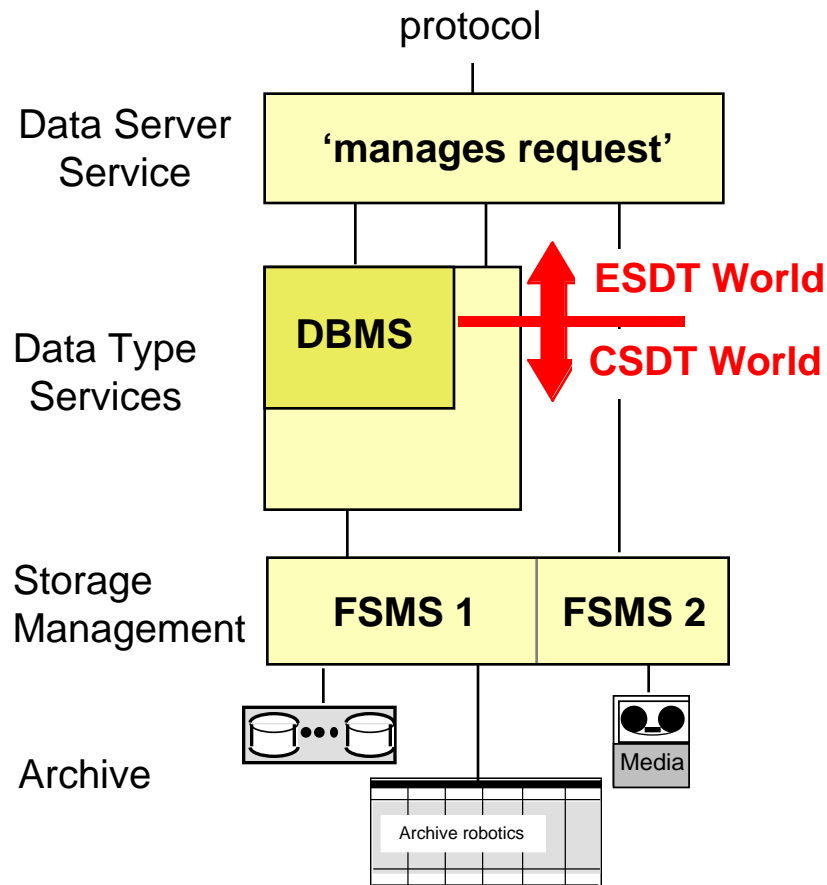


Data Type Taxonomy





Data Server Overview



Manages data for both the PUSH and PULL aspects of EOSDIS.

Key Points

- Receives requests in terms of ESDTs which are converted to functions on CSDTs
- flexibility to store and manage different types
- DBMS selection influences design solution
- highly desirable that it supports multiple FSMS
- highly desirable that it supports sub-file access
- must support multiple archive technologies



SDPS Hardware Overview

